

Headquarters U.S. Air Force

Integrity - Service - Excellence

In-Work Joint C4ISR Flight Plan Shortening the Kill Chain Through Net Centric Ops



**Lt Col Ron Reagan
AF/XICA
DSN 425-6154**

U.S. AIR FORCE

29 Sep 04



HQ USAF/XI Proprietary

Net-Enabled Capabilities Improve Effects

OBJECTIVE:

Shorten the Kill Chain

Achieve

EFFECTS:

Decision Superiority
Greater Speed
Greater Precision

Need

CAPABILITIES:

Global Network Connectivity
Network-Enabled Platforms/Weapons
Fused Intel
Real Time C2 and SA

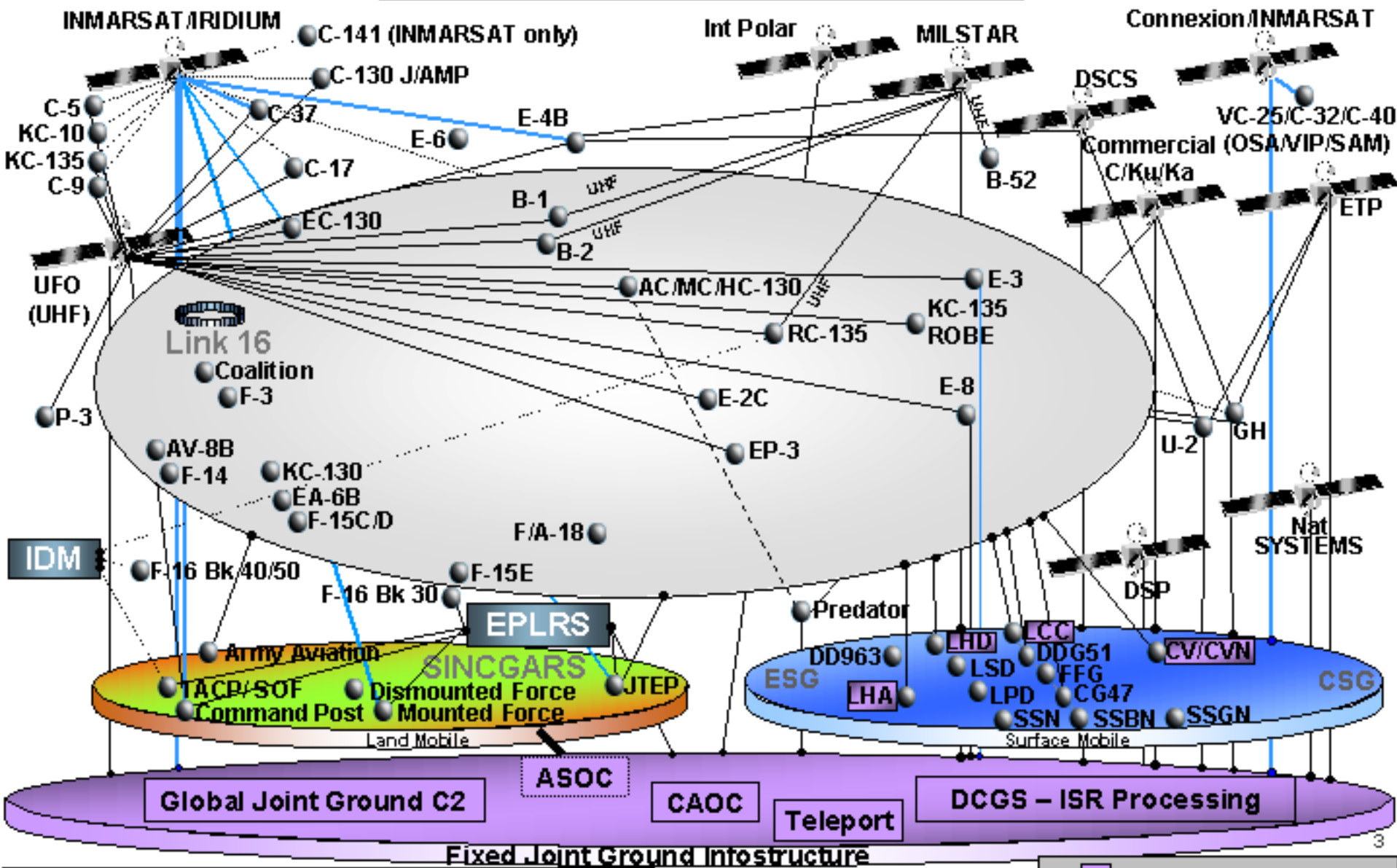
Key: Net-Centric Operations

IP-based routing, shared data, assured service

Joint FY 05 Constellation Net

AF/XI Proprietary

Connexion/INMARSAT



3

No Significant IP or Data Link Capability:





A-10 B-1 (58) B-52 C-5 C-9 C-17 C-130J/AMP C-141 KC-10
F-117 HH-60 KC-135 NIMROD E-6 C-40 AIP MH-53E SH60
HH-60H P-3 UH-1Y AH-1Z F-14 MH-60

Future platforms: F/A-22 F-35
E-10 ABL UCAV CV-22 KC-X
MMA BAMS TUAV ACS V-22

= IP Dynamic Routing
— = IP Data
X = Decommissioned
Green Text = Added Capability

Connexion / INMARSAT



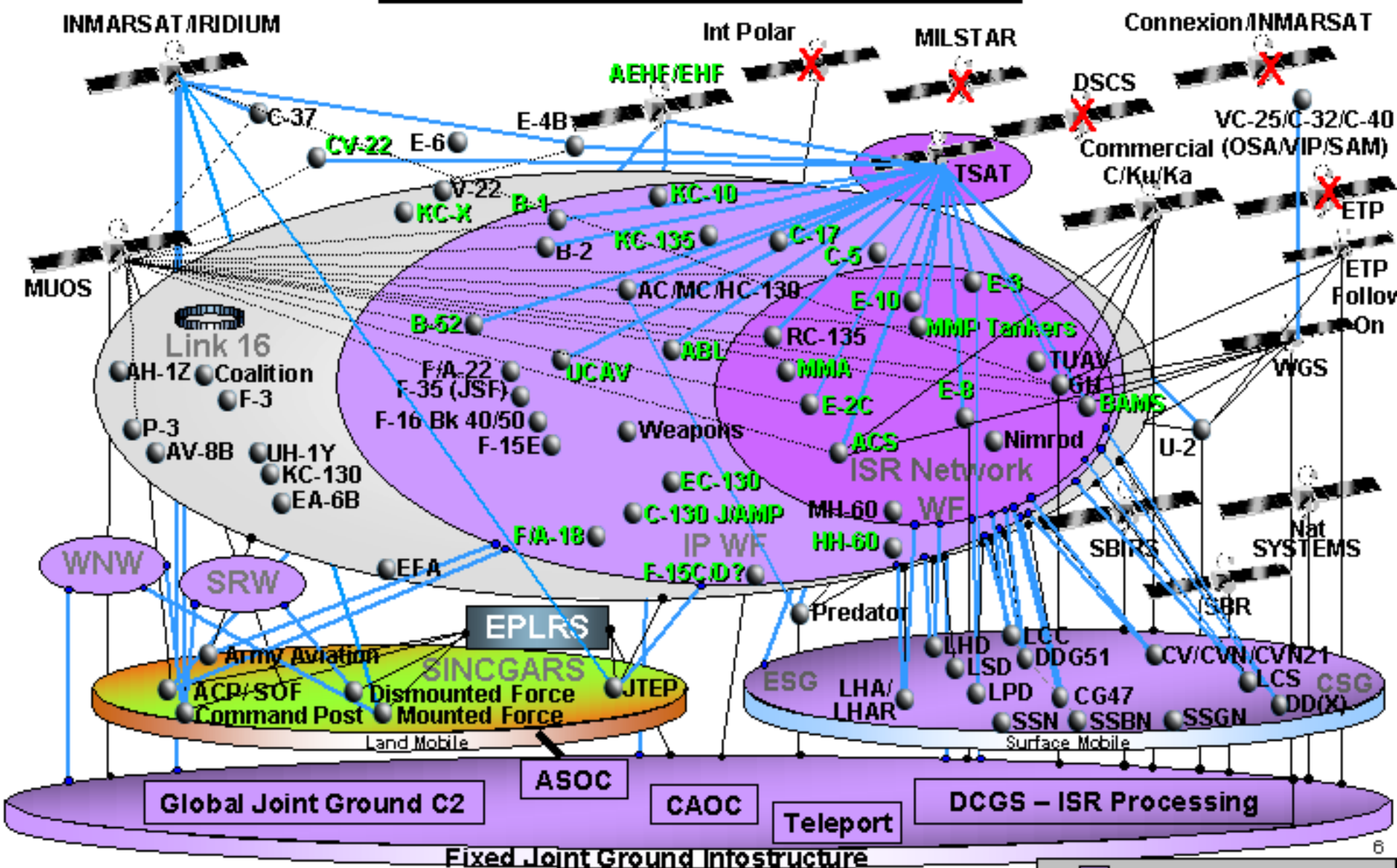
 = IP Dynamic Routing
 = IP Data
 = Decommissioned
 = Added Capability

Connexion / INMARSAT



Green Text = Added Capability

Joint FY 20 Constellation Net



No IP or Data Link Capability:
C-40 AIP

AF/XI Proprietary

= IP Dynamic Routing
 = IP Data
X = Decommissioned
Green Text = Added Capability



Critical Enablers to Net Centric Ops

Global Network Connectivity

- *TSAT
- *APS
- *MMP
- *GIG-BE
- *CITS-Net Ops / IA
- *IPv6
- *Teleport
- WGS
- AEHF
- ETP Follow On
- MUOS
- TDC
- CRC
- NCES
- Crypto Modernization
- ROBE / JTEP

Network-Enabled Platforms/Weapons

- *JTRS
- *TTNT-like WF
- *MP-CDL
- *FAB-T
- *GMT
- Link 16
- TACP-M
- WDL

* Indicates critical path enduring programs and essential technologies providing:

- IP-based routing
- Shared data access
- Assured service
- Essential technology
- Evolutional combat capabilities

Fused Intel

- *DCGS
- *NCCT / AT3

Real Time C2 and SA

- *MC2A
- *AOC Upgrades
- MP-RTIP
- SBIRS
- SBR
- GPS
- METSAT / NPOESS
- Aircraft and Sensor Upgrades
- GCCS-AF
- JC2
- CID
- BFT
- FIOP



Critical Enablers to Net Centric Ops

Global Network Connectivity

- ***TSAT**
Transformational Satellite
- ***APS**
Advanced Polar Satellite
- ***MMP**
Multi-Mission Payload
- ***GIG-BE**
Global Information Grid Bandwidth Expansion
- ***CITS-Net Ops / IA**
Combat Information Transport System
- ***IPv6**
Internet Protocol Version 6
- ***Teleport**

Network-Enabled Platforms/Weapons

- ***JTRS**
Joint Tactical Radio System
- ***TTNT-like WF**
Tactical Targeting Networking Technology
- ***MP-CDL**
Multi-Platform Common Data Link
- ***FAB-T**
Family of Advanced Beyond Line of Sight Terminals
- ***GMT**
Ground Multiband Terminal

Fused Intel

- ***DCGS**
Distributed Common Ground System
- ***NCCT / AT3**
Network-Centric Collaborative Targeting/Advanced Tactical Targeting Technology

Real Time C2 and SA

- ***MC2A**
Multisensor Command and Control Aircraft
- ***AOC Upgrades**
Air & Space Operations Center

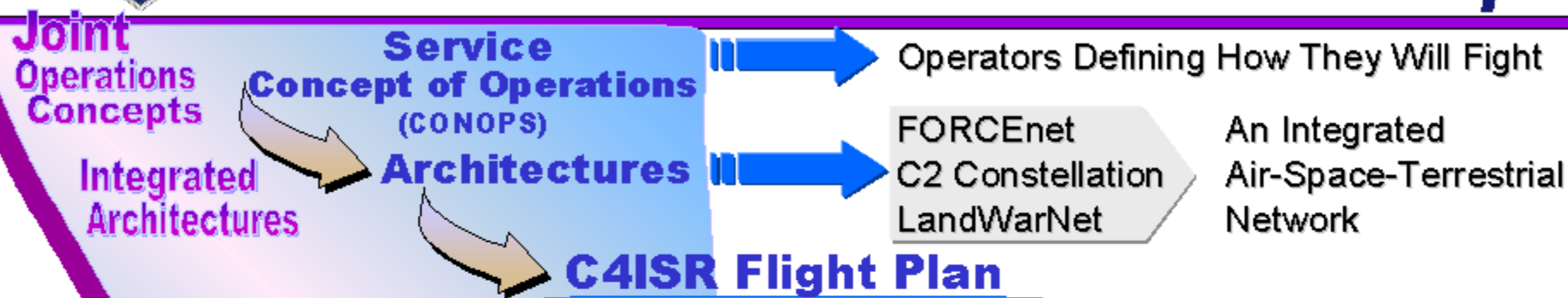
* Indicates critical path enduring programs and essential technologies providing:

- IP-based routing
- Shared data access

- Assured service
- Essential technology



Future Joint C4ISR Flight Plan for Net Centric Ops



Critical Enablers

IP Routing			Shared Data			Assured Delivery			Essential Technologies		
ARMY	AF	USN	ARMY	AF	USN	ARMY	AF	USN	ARMY	AF	USN
TSAT IPv6 JTRS Teleport CDL WMN-7	TSAT APS FAB-T/GMT IPv6 JTRS MMP MPCDL Teleport	TSAT APS MUOS FAB-T NMT/WSC-6 IPv6 JTRS ADNS CDL Teleport	DCG9-A NCES JC2 XML IDM Joint COI GCCS-A	DCGS 10.2 AOC Upgrades MC2A	DCGS (N) CSG/ESG Upgrades JC2 USMC MCEITS C2PC DCGS MC TCO	GIG-BE NETOPS QOS NLDS	CITS/NetO psIA GIG-BE	NMCI/NetO psIA GIG-BE	HIPE WMWV WEB Services KML WMN-T	NCCT	Antenna Technologies

Common Framework

- **Integrated capabilities**
- **Synchronized fielding schedules**
- **Coordinated funding strategy**
- **Discovered trade space**

HQ USAF/XI Proprietary *Integrity - Service*

Joint Effects

Decision Superiority
Greater Speed
Greater Precision

In Summary

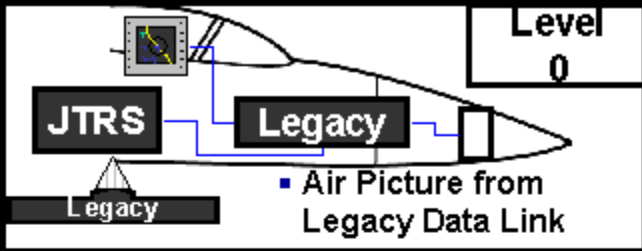
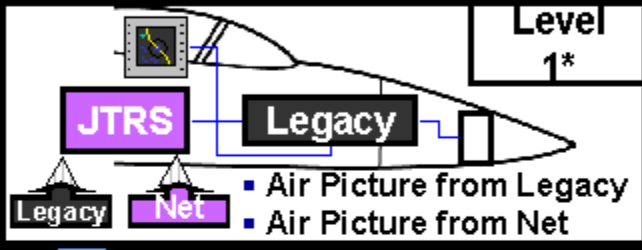
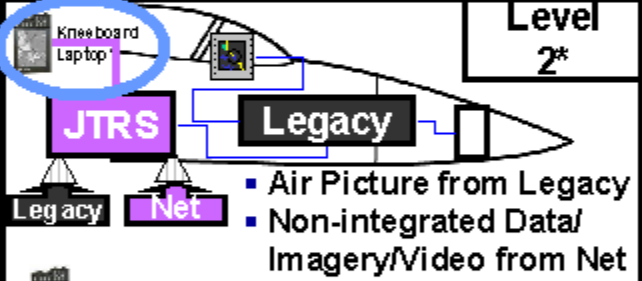
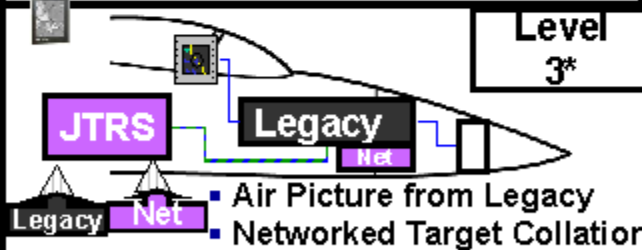
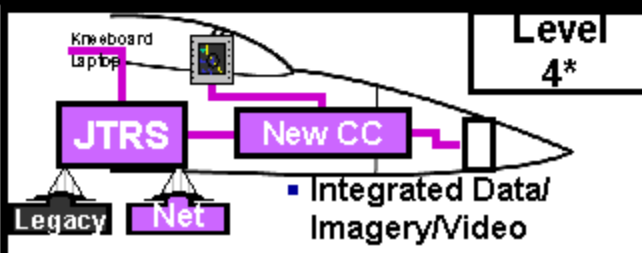


Air Force is fully committed to co-developing integrated capabilities delivering **Joint effects** by significant investment in time, resources, and people to advance **Joint Net-Centric Capability**

Key: Net-Centric Operations

***IP-Based Routing, Shared Data, Assured Service
To Conduct Global Employment & Sustainment Operations***

Levels of Aircraft Network Enabling

 <p>Level 0</p> <ul style="list-style-type: none"> Air Picture from Legacy Data Link 	Computer Equivalent <ul style="list-style-type: none"> Using Computer as a Word Processor 	Example <ul style="list-style-type: none"> Link 16 Ground Track from Link 16 	What You Get <ul style="list-style-type: none"> Legacy IER JTRS Policy Compliance
 <p>Level 1*</p> <ul style="list-style-type: none"> Air Picture from Legacy Air Picture from Net 	Computer Equivalent <ul style="list-style-type: none"> Send/Receive Word Documents from Net 	Example <ul style="list-style-type: none"> Link 16 Ground Track from GIG 	What You Get <ul style="list-style-type: none"> Legacy IER M2M GIG Connected
 <p>Level 2*</p> <ul style="list-style-type: none"> Air Picture from Legacy Non-integrated Data/Imagery/Video from Net 	Computer Equivalent <ul style="list-style-type: none"> Internet Explorer on Desktop 	Example <ul style="list-style-type: none"> Desktop Capability (e.g. E-mail, NIPR/SIPR, etc.) 	What You Get <ul style="list-style-type: none"> Man-in-the-loop GIG Connected
 <p>Level 3*</p> <ul style="list-style-type: none"> Air Picture from Legacy Networked Target Collation 	Computer Equivalent <ul style="list-style-type: none"> "Sharing" a Word Document with your workgroup 	Example <ul style="list-style-type: none"> AT3 Target Geo-location 	What You Get <ul style="list-style-type: none"> Integrated M2M targeting collaboration
 <p>Level 4*</p> <ul style="list-style-type: none"> Integrated Data/Imagery/Video 	Computer Equivalent <ul style="list-style-type: none"> Some Level of Bill Gates' House 	Example <ul style="list-style-type: none"> Target Video 	What You Get <ul style="list-style-type: none"> Fully integrated M2M Network enabled data exchange

Platforms: B-1, A-10, F-15, F-16, etc.

Platforms: Global Hawk, Tankers

Platforms: E-10, F-35, UCAV

Converging Architectures

Global Information Grid

Joint Enterprise

DISN

GIG-BE

GBS

STEP / TELEPORT

TSAT

NCES

IA

JTRS

Army Enterprise

LandWarNet

Air Force Enterprise

C2 Constellation

Naval Enterprise

FORCEnet

WARFIGHTING

**OPERATIONAL
SUPPORT**

INFOSTRUCTURE
LandWarNet

WARFIGHTING

**OPERATIONAL
SUPPORT**

INFOSTRUCTURE
ConstellationNet

WARFIGHTING

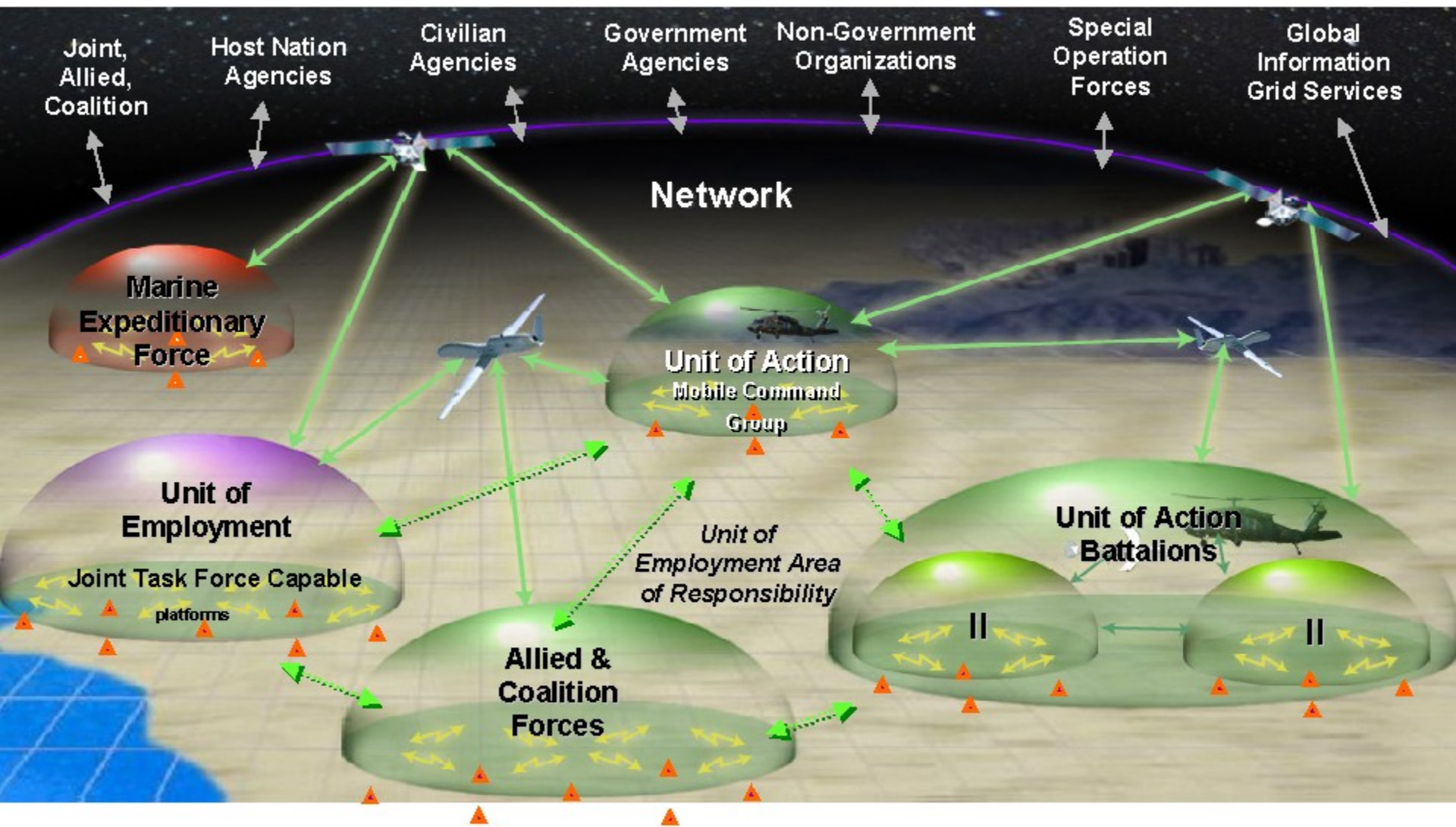
**OPERATIONAL
SUPPORT**

INFOSTRUCTURE
FORCEnet

SOF Network

Standards and Protocols (IPv6) + NetOps

LandWarNet



LandWarNet provides *INTERNAL* Infosphere connectivity and *EXTERNAL* Interoperability

Major Waveform Communities for Battle Command Actors

DRAFT

CONUS

National Capabilities

Other Actors:

- TACP
- Surface Ships
- AMD

F/A-18
AC-130



DISMOUNTED FORCE

- Low power
- Voice and low rate data
- Primarily LOS
- OTM

Small UAV

UGS

CDR

Small UGV

COMMAND POST

- Voice and low to high rate data
- NLOS and BLOS
- ATH

JSTARS

U2

HAA

JIC

JTF

UA

GSR

Prophet

MBCOTM

CDR

Combat Formation

Mounted Battle Com on-the-move

AVIATION

- NLOS and BLOS
- Voice and low to high rate data

A2C2S

AH-64

ARH

MOUNTED FORCE

- Voice and low to medium rate data
- LOS and NLOS
- ATQH/OTM

RECCE





Joint Waveform Roadmap

DRAFT

Communities	Today	2008	2010	2012
Dismounted Force	SINGARS	EPLRS (LW)		SRW
Mounted Force	SINGARS, EPLRS, L			WNW
Command Post	SINGARS, EPLRS			SRW, WNW
	NTDR, HCLOS			WNW, High Band?
	TIBS			CIB
	Commercial SATCOM, UHF DAMA	SHF & WGF, AEHF		TSCS
Aviation	Have Quick, SINGARS, Link 16		Airborne Networking Waveform	
Data Link	Std CDL, T-CDL, Link 16			N-CDL
Logistics Sensors	Commercial SATCOM			MILSATCOM (X?)